



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,288	04/11/2006	Marcus Johannes Henricus Van Dal	NL 031259	1784
65913	7550	05/16/2008		
NXP, B.V. NXP INTELLECTUAL PROPERTY DEPARTMENT M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131			EXAMINER INGHAM, JOHN C	
			ART UNIT 2814	PAPER NUMBER
			NOTIFICATION DATE 05/16/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary

Application No.

10/575,288

Applicant(s)

VAN DAL ET AL.

Examiner

JOHN C. INGHAM

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CD/CD)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims **1-6** are rejected under 35 U.S.C. 102(b) as being anticipated by Chao (US 4,818,715).

4. Regarding claims **1 and 5**, Chao discloses in Fig 5i a semiconductor device and a method of manufacturing the device, with a substrate and a semiconductor body (Si) of silicon which comprises a field effect transistor having a source region (n+, left side)

Art Unit: 2814

which borders on the surface of the semiconductor body and which is connected to a lower-doped, thinner source region extension (n- -, left side) and having a drain region (n+, right side) which borders on the surface of the semiconductor body and which is connected to a lower-doped, thinner drain region extension (n- -, right side), which regions and extensions are of a first conductivity type, and having a channel region situated between said regions and extensions, which channel region is of a second conductivity type, opposite to the first conductivity type, and having a gate electrode (poly) separated from the channel region by a dielectric region (SiO_2), the source region and the drain region being provided with a connection region (Silicide, left and right sides) containing a metal silicide, characterized in that the source region and the source region extension, and the drain region and the drain region extension are in each case connected with each other via an intermediate region (n- regions, left and right sides) of the first conductivity type the thickness and doping concentration of which range between those of the region and the extension which are connected with one another by the intermediate region.

5. Regarding claims **2 and 6**, Chao discloses in Fig 5i the device and method of claims 1 and 5, characterized in that the connection region (Silicide) is recessed in the semiconductor body (Si), and the metal silicide is formed by providing a metal on the semiconductor body and allowing this metal to react with silicon of the semiconductor body to form the metal silicide of the connection region (col 3 ln 38-42).

6. Regarding claim **3**, Chao discloses in Fig 5i the device of claim 1, characterized in that a spacer (poly oxide) of an electrically insulating material is situated on the

Art Unit: 2814

semiconductor body on either side of the gate electrode, and the intermediate region and the associated extension (n- -, n-) are situated below these spacers, viewed in projection.

7. Regarding claim 4, Chao discloses in Fig 5i the device of claim 1. The claim language "the intermediate region is formed by means of ion implantation" describes a product by process. See MPEP 2113. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

Art Unit: 2814

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims **7, 8 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chao and Wristers (US 6,406,964).

11. Chao discloses that method as claimed in claim 5, with a spacer of an electrically insulating material formed on either side of the gate electrode, and the intermediate region formed by an ion implantation of a doping element of the first conductivity type, but does not specify wherein the ion implantation is carried out at an acute angle with respect to the normal of the semiconductor body surface.

12. Wristers teaches in Fig 3-5 wherein ion implantation forms an intermediate region, and the ion implantation is formed at an acute angle of 20° with respect to the surface of the substrate (col 5 ln 56) in order to reduce off-state leakage currents (col 2 ln 49-53). The source region and the drain region are also formed by means of an ion implantation immediately before the formation of the intermediate region (Fig 3, col 5 ln 24) and all of the regions are tempered in the same heat treatment (annealed at Fig 5, col 6 ln 35).

13. Claim **9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chao and Wristers as applied to claim 7 above, and further in view of Yu (US 6,225,176).

14. Chao and Wristers disclose the method of claim 7, and Wristers further teaches that ion implantation should be carried out at a flux of 5×10^{13} at/cm². Wristers does not

specify that the implant energy be between 0.5 and 10 keV, but does teach that the energy is dependant on the dopant material (col 6 ln 15-33).

Yu teaches that an ion implant may be carried out with an energy of 1-5 keV for intermediate depth regions (see Fig 1 items 23 and 25, Fig 4 and Fig 5 area between 40 and 42, and col 5 ln 30). However, the implant energy would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ 2d 1934, 1936 (Fed. Cir. 1990).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN C. INGHAM whose telephone number is (571)272-8793. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Howard Weiss/
Primary Examiner
Art Unit 2814

John C Ingham
Examiner
Art Unit 2814

/J. C. I./
Examiner, Art Unit 2814